The Rock Record – March, 2010

Please contribute to the SGS Newsletter

The SGS Newsletter is produced by the SGS executive. Letters, announcements, notices, comments, photos, news and information about SGS members, etc. are always welcome. Call an executive member or write to us at:

Saskatchewan Geological Society
P.O. Box 234
Regina, SK S4P 2Z6

SGS e-mail address:
info@sgshome.ca

SGS Website:
www.sgshome.ca

All advertising inquiries should be directed to **Tyler Music**

In This Issue

Wednesday, March 24th, 2010; starts at 6:00 p.m.

Faculty Club, University of Regina

Student Career Night

Presentations by Kim Kreis (Petroleum Geological Consultant) and Ryan Morelli (Saskatchewan Geological Survey)

All members are welcome. Free pizza.

Co-sponsored by the SGS and APEGS

Friday, April 16th, 2010

The Biogenic Hypothesis: Microbial Acids and Gas as an Explanation for the Dissolution and Forming of Pores and Caves in Limestone

Stephanie Schwabe (CSPG Lecturer)

Lancaster Room, Royal Canadian Legion
Lunch: 11:45 a.m.
Meeting: 12:00 – 1:00 p.m.
Members: $10.00 and Non-members: $15.00 for lunch
For those not having lunch the talk is free
Please contact: Kate MacLachlan (kate.maclachlan@gov.sk.ca or 787-9059)
By Noon, Tuesday, April 13th if you are having lunch

Free public lecture, Wednesday, May 5th, 7:30 p.m.
Regina Science Centre
The Buzzard Coulee Meteorites, Western Saskatchewan
By Ellen Milley, Graduate Student, University of Calgary

SGS ANNUAL FIELD TRIP TO THE BIGHORN BASIN, WYOMING

The SGS Field Trip this year is going to the Big Horn Basin of Northern Wyoming from Friday, August 20th to Tuesday, August 24th. Highlights will include outcrops of the Cretaceous Frontier Formation clastics, Mississippian Madison Formation carbonates, including karsting, Laramide basement structures, and hydrothermal systems. A non-refundable deposit of $250.00, payable to the Sask. Geological Society by July 31st, is required to reserve your space. The estimated total cost will be on the order of $500.00 and will include accommodations, lunches, transportation and a field trip guide. Call John Lake, field trip coordinator, at (306)-787-2621 to register.

At the request of APEGS, the Society is seeking a **volunteer** to be our representative on a planning committee for their AGM which will be held in Regina in May, 2011. According to the committee chair the committee will meet monthly from Fall 2010 up until the AGM. The purpose of the committee is to find speakers and MC's and help to decide what some of the secondary activities will be and where. The commitment is fairly light, with little work required outside of the meetings. APEGS will do all of the booking and logistical work. The SGS can help the representative from our end. So if anyone is interested please contact Murray Rogers (murray.rogers@gov.sk.ca) or 787-1932.

Following from the discussion at the SGS AGM regarding the reorganization at the University of Regina and its impact on the Geology Department, the Society sent a letter on February 23rd to Dr. Vianne Timmons, President of the U. of R., expressing our concerns, the reasons for the concerns, and our support for the Department. Copies were also sent to APEGS, the Ministry of Energy and Resources, and the Saskatchewan Mining Association.

A reminder, if you haven't renewed your 2010 membership yet please fill out the attached form and submit it with the payment at a meeting, or mail it to the SGS postal address on the first page.

The Biogenic Hypothesis: Microbial Acids and Gas as an Explanation for the Dissolution and Forming of Pores and Caves in Limestone

SPEAKER

Stephanie Schwabe
Department of Earth and Environmental Sciences, University of Kentucky

The current explanation for the formation of caves in the Bahamas is that mixing of CaCO3-supersaturated seawater with CaCO3-saturated groundwater creates undersaturated mixed water that is capable of dissolving the limestone to produce large voids. We now know that the mixing of these bodies of water cannot dissolve limestone unless there is a continuous source of acids to overcome the buffering effects of the limestone. Similarly, rainwater that is slightly acidic via incorporation of atmospheric and soil CO2 cannot remain acidic during its passage through the vadose zone, a time frame, which may be as long as two months. Interstitial bacteria are the obvious sources of the acids needed to initiate and maintain acidic meteoric and ground-water conditions. We have shown that sterile-caught rainwater on San Salvador Island contains 103 bacteria/ml before contact with the ground, has a pH of 5.6, and is buffered within 3 minutes following contact with limestone. The pH of dripstone water, measured as it exits a stalactite, contained >104 to 105 bacteria colony-forming-units (cfu)/ml and had a pH of 6.7. The pH of a small pool directly below the dripping stalactite had a pH of 7.7. We hypothesize that the dissolution capacity of vadose water is controlled by the assimilation of bacterially generated acids, produced by bacteria living in the pores of the host rock. Abundant bacteria have been documented in the vadose zone (>106 cfu), in phreatic water (>106), and in the rock walls of caves (>106). In an air-filled cave, 2.2 g CO2/kg/day was measured coming out of the cave ceiling, and 770 ppm CO2 was generated by a 0.5 g sample of cave wall rock held in a sealed container. These same gases generated by bacteria are also forming pores as large as 2 cm in unconsolidated sediments. The bacterial mucilage glues the carbonate grains together and as microbial gases accumulate within this mucilage, it expanses generating large pores within the sediment. Although this research is considered novel, we have discovered that as early as 1904, scientists had discovered that interstitial bacteria were responsible for the disintegration of building stones in England. What they characterized as bacterial disease of rocks, we suggest is the primary driving force for dissolution of limestones in the Bahamas.

BIOGRAPHY

Stephanie Jutta Schwabe, received her B.A. in Geology from the College of Charleston in 1990, her MSc from Mississippi State University in 1992, her Ph.D. in Biogeochemistry from the University of Bristol, UK in 1999. She also earned a J.D. with focus in International Environmental Law and Maritime Law from the University of Queensland, Australia in 2003. She was admitted to the Queensland Bar, both as a Barrister and Mediator the same year. She is also a consultant on environmental issues and modern day carbonate rocks, primarily working with Bahamians who are fighting to save their environment. A native of Charleston South Carolina, Dr. Schwabe has been diving for over 25 years in the Bahamas, and is the founder and director of the Rob Palmer Blue Holes Foundation, named after her husband, following his death. She became a celebrity in the dangerous world of cave diving, fought powerful interests to protect the “blue holes” of the Bahamas and as a result her adventurous stories have been featured in book titled, “Women of Discovery: A Celebration of Intrepid Women,” Who Explored the World, “The Third Man Factor,” which describes near death experiences of explorers; Champions for Change, Athletes Making a World of Difference as it concerns environmental issues, a UN publication; and a soon to be released book titled, Women under Pressure, describing what women have to endure in the mostly male dominated world of diving . She has just finished writing her own book titled: Living in Darkness: A Women’s scientific and exploratory adventures into the Black and Blue Holes of the Bahamas, published by Greyhound Press. Her work and adventures have been recorded by Discovery, Discovery Animal Planet, German and French National Television, World of Wonder and by an Australian Production company, Beyond, BBC on a series called, ‘Oceans,’ and several other international and national TV programs. She just recently finished working with NHK Japan Television generating a science film project on the geological story of how the Bahama Island formed including the underwater caves of the Bahamas.

She has taught Geology, Environmental Geology, and Environmental Science and Policy at the College of Charleston for five years. She came to San Diego in 2007 to teach for one year at the University of San Diego where she taught, Geological Oceanography, Environmental Geology, History of Climate Change, and Environmental Law and Policy at the School of Peace and Justice and just recently began teaching at the University of Kentucky in the Department of Earth and Environmental Sciences.

SGS MEMBERSHIP FORM – 2010

(If you have access to electronic mail, please provide your e-mail address in the space provided below)

I, _ _____ , wish to renew my/apply for a membership in the
SASKATCHEWAN GEOLOGICAL SOCIETY for 2010.

MY STATUS IS (please check one):

[ ] ACTIVE ($25.00)
[ ] ASSOCIATE ($25.00)
[ ] AMATEUR ($10.00)
[ ] STUDENT ($5.00)
[ ] LIFETIME ($350.00)

MY CURRENT MAILING ADDRESS IS:

[ ] No change from last year
[ ] New address (please print):

_____

_____

_____

Mail to:
Saskatchewan Geological Society
P.O. Box 234
Regina, SK S4P 2Z6

SGS e-mail address:
info@sgshome.ca

Please provide your e-mail address:

_____

Your SGS newsletter will automatically be sent to you by e-mail as an attachment in MIME format. Note that you'll receive it sooner this way than by regular mail.

[ ] please check, if you **do not** want to receive the newsletter by e-mail

I am enclosing _____ along with the renewal form.

[ ] RECEIPT REQUESTED (please check, if required)

_____

(SIGNATURE)

THANK YOU!